

REMARKS

Claims 1-20 were originally presented in the subject application. Claims 1-3, 6-10, 13-16 and 19-20 were amended, and claims 4-5, 11-12 and 17-18 canceled without prejudice, in a response dated June 15, 2007. Claims 1-2, 8-9 and 13-16 have hereinabove been amended to more particularly point out and distinctly claim the subject invention. No claims have herein been added or canceled. Therefore, claims 1-3, 6-10, 13-16 and 19-20 remain in this case.

The addition of new matter has been scrupulously avoided. In that regard, support for the common amendment to claims 1, 8 and 15 can be found in the specification at, for example, numbered paragraphs 0020 and 0031.

Applicant respectfully requests reconsideration and withdrawal of the grounds of rejection and objection.

35 U.S.C. §101 Rejection

Claims 8-10, 13 and 14 were rejected under 35 U.S.C. §101 as allegedly directed to non-statutory subject matter. The Office Action alleges that the claimed system would reasonably be interpreted by one of ordinary skill in the art as software, *per se*.

In particular, the final Office Action indicated that either a processor or computer was necessary in the noted claims. Although Applicant disagrees for the reason below, Applicant has amended the rejected claims as suggested (i.e., included a processor) in order to advance prosecution. However, Applicant reserves the right to file claims directed to means-plus-function versions as filed.

Applicant submits that 35 USC Section 112, paragraph 6, provides the opportunity to claim apparatus in means-plus-function language. The claims are interpreted to include the means disclosed in the specification and equivalents thereof. As noted in Applicant's prior response, the means comprise either system in FIG.1, as described in the specification at, for example, numbered paragraphs 0014 and 0015.

Therefore, Applicant submits the claims overcome the noted rejection.

35 U.S.C. §112 Rejection

The Office Action rejected claims 1-3, 6-10, 13-16 and 19-20 under 35 U.S.C. §112, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Applicant respectfully, but most strenuously, traverses this rejection.

In particular, the final Office Action alleged that the phrase “one or more resources protected by shadow time” in the independent claims was unclear. To explain, the one or more resources are “protected” in the sense that they are currently in use and, therefore, not currently available. To clarify, Applicant has amended the noted language in the independent claims to recite that the one or more resources are currently unavailable due to shadow time.

The final Office Action also alleged that the phrase “complex scheduler” in claims 2, 9 and 16 was unclear. To explain, the scheduler is complex in that it can perform complex tasks, such as backfill scheduling, which is much more complex than simple scheduling. To clarify, Applicants have amended the noted claims to recite that the scheduler on each system is adapted to perform backfill scheduling.

As amended, Applicant submits the claims overcome the stated rejection.

35 U.S.C. §103 Rejection

The Office Action rejected claims 1-3, 6-10, 13-16 and 19-20 under 35 U.S.C. §103(a), as being obvious over DeBettencourt et al. (U.S. Patent No. 6,279,001) in view of Liu et al. (U.S. Patent No. 5,031,089). Applicant respectfully, but most strenuously, traverses this rejection.

Claim 1 recites a method of balancing workload of a computing environment. The method comprises obtaining, by a manager daemon of one system of a grid computing environment, scheduler information from a scheduler of another system of the grid computing environment. The scheduler information includes current free nodes of the another system, job queue of waiting jobs for the another system, shadow time for the next waiting job of the another

system indicating how long the job needs to wait for resources, and one or more resources protected by shadow time. The method further comprises performing by the manager daemon workload balancing of at least two systems of the grid computing environment, each system of the at least two systems comprising a scheduler to schedule workload on its system, the workload balancing using at least a portion of the obtained scheduler information. The workload balancing comprises backfill scheduling a job, the backfill scheduling allowing the job to run out of order as long as it does not affect the start time of another job scheduled to execute.

Against the aspect of scheduler information from a scheduler of another system of the grid computing environment, for example, the final Office Action cites to DeBettencourt at column 10, lines 30-36 and column 13, lines 8-25. The first cited section lists information about the host in Table 1 that the agent can provide to the manager. However, the list does not include scheduler information. The second cited section of DeBettencourt discloses the agent (which is part of the host – see column 6, lines 14-16) obtaining queue wait time for another server on the same host. Note that the information is not obtained regarding another host, but another server on the same host. Applicant submits that another server on the same host cannot fairly be said to correspond to another system in a grid computing environment. Moreover, the information is being obtained by the agent, which also resides on the same host, and not the manager.

Similarly, against the aspect of the scheduler information including a job queue of waiting jobs for the other system, the final Office Action cites to DeBettencourt at column 13, lines 15-20. However, as noted above, this section speaks to obtaining information about another server on the same host, not another host.

Further, against the information obtained from another system including shadow time for the next waiting job of the other system indicating how long the job needs to wait for resources, the final Office Action cites to DeBettencourt at column 13, line 16 (server queue delay). However, again, this section speaks to obtaining information about another server on the same host, not another host. Moreover, Applicant submits that server queue delay is not the same thing as shadow time, which is dynamic.

Based on the above, Applicant submits the information disclosed as being obtained in DeBettencourt cannot be equated to the information recited in claim 1. Thus, anything done based on that information is also not taught, such as the claimed workload balancing. Again, note that the load balancing cited in column 13 of DeBettencourt refers to balancing the load of multiple web servers on the same host, not multiple hosts.

Against the aspect of claim 1 regarding the scheduling information including current free nodes of the other system, the final Office Action cites to Liu at column 9, lines 35-65. The cited section of Liu teaches a given node in the system obtaining workload indicators from the other nodes in the system. However, all the nodes are within the same system. Claim 1 recites the scheduler information is obtained by one system from another system, which is why the recitation of a grid computing environment cannot be ignored.

Finally, against the aspect of claim 1 of backfilling, the final Office Action cites to the Abstract of Liu, alleging that backfilling corresponds to transferring a task from a heavily-loaded queue to an under-loaded queue. However, as recited in claim 1, backfilling allows a job to run out of order as long as it does not affect the start time of another job scheduled to execute. Applicant submits the Abstract of Liu does not even mention tasks running out of order, let alone doing so as long as it does not affect the start time of another task scheduled to execute.

Therefore, Applicant submits that claim 1 cannot be rendered obvious over DeBettencourt in view of Liu.

Claims 8 and 15 include aspects similar to those argued above with respect to claim 1. Thus, the remarks above with respect to claim 1 are equally applicable thereto. Therefore, claims 8 and 15 also cannot be made obvious over DeBettencourt in view of Liu.

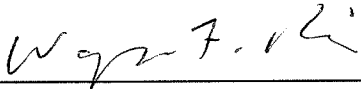
CONCLUSION

Applicants submit that the dependent claims not specifically addressed herein are allowable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their additional limitations.

For all the above reasons, Applicants maintain that the claims of the subject application define patentable subject matter and earnestly request allowance of claims 1-3, 6-10, 13-16 and 19-20.

If a telephone conference would be of assistance in advancing prosecution of the subject application, Applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,



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